

Searching new physics via features of the stochastic gravitational wave background

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Characteristic patterns can emerge in the spectral shape of the stochastic gravitational wave (GW) background through various mechanisms. For instance, the GW background generated via second-order scalar perturbations, often discussed in the context of primordial black hole formation, exhibits a distinct spectral shape. Additionally, scalar-induced GWs excited during inflation and specific types of quantum gravity theories can produce a stochastic GW background with logarithmic oscillations. These specific shapes in the GW spectrum can be identified through template-based analysis methods. In this talk, I will present an example of a template-based search and constraints on scalar-induced GWs using the most recent LVK O3 data. Subsequently, I will discuss future prospects for third-generation GW experiments such as the Einstein Telescope, focusing on the example of the log-oscillation feature.

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